SB761
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1995

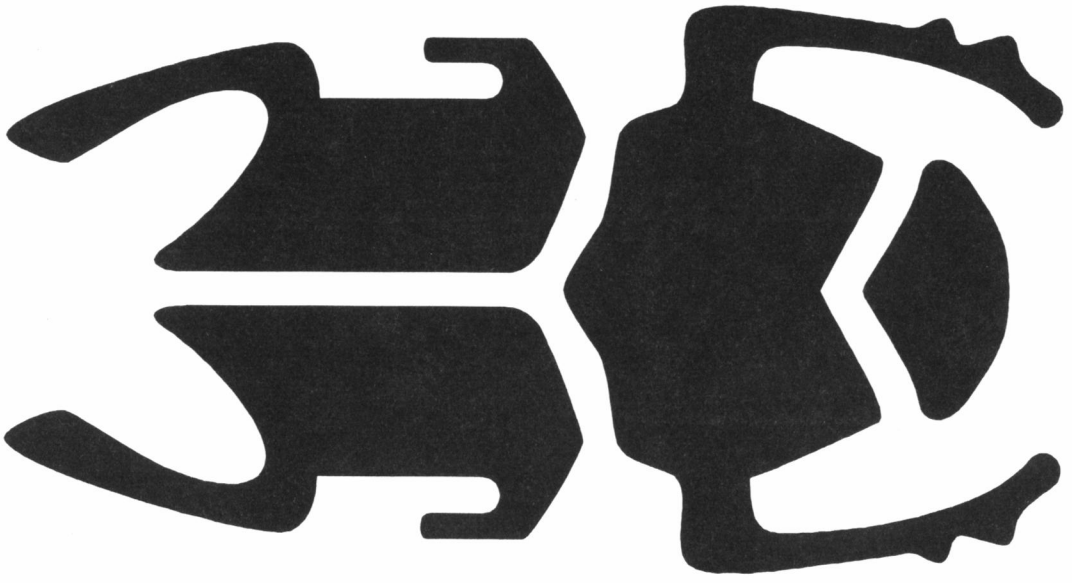
United States
Department of
Agriculture

Forest
Service

Intermountain
Region

Ogden, Utah

1995 Forest Insect and Disease Conditions



Intermountain Region

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ROCKY MT. FOREST & RANGE
EXPERIMENT STATION

FOREST INSECT AND DISEASE CONDITIONS

in the

Intermountain Region

1995

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April
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INTRODUCTION

This report summarizes the status of forest insect and disease activity in the Intermountain Region, comprising parts of Idaho, Utah, Nevada, Wyoming and California. Insect status is based largely on annual aerial detection surveys conducted over 14,000,000 acres of forested lands. Disease status is based largely on ground observations and surveys.

General insect and disease information is summarized in the Summary of Conditions.

Numbers of trees killed by major bark beetles and affected acreages are displayed in Tables 1 through 8. Acres surveyed, by administrative area, during 1995 are summarized in Table 9. Figure 1 depicts the number of trees killed by bark beetles in Region 4 between 1981 and 1995. Figure 2 depicts acres defoliated by Douglas-fir tussock moth and western spruce budworm in Region 4 between 1960 and 1995. General location of major insect activity is shown in Figures 3 through 7.

The Special Project Update summarizes on-going studies conducted by Forest Health Protection in cooperation with other Regions, USFS Research, and universities.

Recent publications are listed to assist the reader in locating recent pest information of interest.

SUMMARY OF CONDITIONS

Region-wide, mountain pine beetle caused tree mortality increased in southern Idaho, Utah, and Wyoming from 24,200 trees in 1994,to 41,700 trees in 1995. The largest outbreaks are located on the Dixie, Fishlake, and Manti-LaSal National Forests in Utah, and on the Sawtooth National Recreation Area and Salmon National Forest in southern Idaho. The largest increase in mortality occurred in whitebark and lodgepole pine. Ponderosa pine mortality increased only on the Dixie National Forest.

Recorded spruce beetle mortality decreased in Idaho and Utah. Region-wide, 28,000 dead trees were recorded in 1995 compared to 45,200 in 1994. Decreases in tree mortality in Idaho were attributed to loss of host type due to past outbreaks and extensive wildfire. Recorded mortality on the Dixie National Forest, in Utah, significantly increased while mortality on the Manti-LaSal National Forest, also in Utah, decreased. Populations on these two National Forests still remain at epidemic levels.

Douglas-fir mortality, caused by Douglas-fir beetle infestation, decreased from previous levels with 48,500 trees killed in 1995 compared to 54,500 trees in 1994. Decreases in mortality occurred in Idaho and western Wyoming, while mortality increased in Utah. The largest outbreaks are located on the Boise and Sawtooth National Forests in Idaho, and on the Manti-LaSal, Uinta, and Wasatch-Cache National Forests in Utah.

Western pine beetle mortality increased slightly from 6,300 killed in 1994, to 16,000 trees in 1995. Mortality is located primarily on the Boise and Payette National Forests in southern Idaho. Pine engraver beetle activity was frequently associated with western pine beetle infestation.

A complex of western balsam bark beetle, twig beetle, secondary bark beetle, wood borer, engraver beetle, environmental conditions, and disease pathogens continues to damage and kill subalpine fir throughout the Region. Mortality levels increased in 1995 with 418,800 dying trees observed, while in 1994, 272,900 trees were killed. Mortality throughout the host type affects trees of all size classes.

Fir engraver beetle mortality decreased in Idaho, Nevada, and Utah. Region-wide, 140,700 true fir trees were killed in 1995 compared to 180,500 trees in 1994. Much of this decrease is attributed to a decline in activity on the Boise and Payette National Forests in Idaho. Large outbreaks are located on the Toiyabe National Forest in Nevada, and the Uinta and Manti-LaSal National Forests in Utah.

Foliage diseases of *Populus* species were epidemic in 1995, probably because of prolonged cool, moist weather extending into late June. Rust fungi in the genus *Melampspora* infected aspen, cottonwoods, and willows throughout their host ranges in both forests and residential areas of southern Idaho and northern Utah. Defoliation by the fungus *Marssonina* was common throughout Utah.

In eastern Idaho, cedar apple rust, caused by an undetermined species of *Gymnosporangium*, caused a leaf spot on residential apple trees in Challis and Salmon, and to *Amelanchier* throughout the range of serviceberry in eastern Idaho.

No significant defoliator activity was observed during 1995.

Status of Insects

Cooley spruce gall adelgid

Adelges cooleyi
Host: Spruce
Location: Idaho, Utah, Wyoming

This adelgid was found in forested stands and ornamental trees throughout the Region; impact is greatest on ornamental trees.

Douglas-fir beetle

Dendroctonus pseudotsugae
Host: Douglas-fir
Location: Idaho, Utah

Regionwide mortality decreased slightly with 48,500 trees killed in 1995. Outbreaks were located on the Boise, Sawtooth, and Payette National Forests in Southern Idaho. In Utah, tree mortality increased with 6,700 trees killed in 1994 and 11,500 trees killed in 1995. The largest outbreaks are located on the Manti-LaSal, Uinta, and Wasatch-Cache National Forests. Smaller outbreaks are located on other National Forests in Utah. Mortality on the Bridger-Teton National Forest in western Wyoming decreased from 6,400 trees in 1994 to 2,000 trees in 1995.

Douglas-fir tussock moth

Orgyia pseudotsugata
Host: Douglas-fir, True firs
Location: Idaho, Utah, Nevada

No defoliation was observed in 1995.

European gypsy moth

Lymantria dispar
Host: Various deciduous species
Location: Utah

No moths were detected in 1995. The eradication project in Utah has been completed with gypsy moth populations successfully eradicated. Detection trapping will continue throughout the Region.

Fir engraver beetle

Scolytus ventralis
Host: Grand fir, White fir, Red fir, Subalpine fir
Location: Idaho, Nevada, Utah, California

Fir engraver beetle activity decreased within the Region. Region-wide, 140,700 trees were killed in 1995 compared to 180,500 trees in 1994. In Idaho, a 91 percent decrease in activity occurred on the Boise and Payette National Forests, and on adjacent State and private lands. Only 400 trees were killed in southern Idaho in 1995 compared to 4,400 trees in 1994. Fir engraver beetle activity in Utah remained high with 78,800 trees killed in 1995 compared to 86,600 trees killed in 1994. Most activity was located on the Uinta and Manti-LaSal National Forests where 34,500 and 14,600 dead trees, respectively, were observed. Mortality was also observed on the Dixie, Fishlake, and Wasatch-Cache National Forests. In the areas surveyed in Nevada, activity decreased from 89,500 trees killed in 1994 to 61,500 in 1995. Mortality is located primarily on Federal, State, and private lands in the Tahoe Basin area and adjacent areas of the Toiyabe National Forest.

Jeffrey pine beetle

Dendroctonus jefferyi
Host: Jeffrey pine
Location: Nevada, California

Jeffrey pine beetle activity declined on the Toiyabe National Forest with 8,800 trees killed in 1995. Significant tree mortality continues to occur in the Tahoe Basin area on Federal, State, and private lands. Widespread activity is present throughout other areas on the Toiyabe National Forest.

Mountain pine beetle

Dendroctonus ponderosae
Host: Lodgepole, Ponderosa, Whitebark, Jeffrey, and Limber pine
Location: Idaho, Utah, Wyoming, Nevada

Mountain pine beetle-caused mortality increased from 24,200 in 1994 to 41,700 trees in 1995. In Utah, 25,500 trees were killed during 1995, opposed to 19,100 trees in 1994. Ponderosa pine was the primary host. The largest outbreak is located on the Dixie National Forest where 15,500 trees were killed. Smaller outbreaks were located on most other National Forests in Utah. In Idaho, a significant increase in mortality occurred with 14,400 trees killed in 1995 compared to 4,800 trees in 1994. Mortality occurred in both lodgepole and ponderosa pine. Increases occurred on most National Forests in the Region. The largest outbreak in southern Idaho is located in the Sawtooth National Recreation Area on the Sawtooth National Forest.

Mortality of whitebark and limber pine attributed to mountain pine beetle infestation increased four-fold in 1995. Small, isolated infestations are located on National Forests in Idaho, Utah, and on the Bridger-Teton National Forest in western Wyoming. Larger outbreaks are located on the Manti-LaSal and Fishlake National Forests in Utah.

Pine engraver beetle

Ips pini
Host: Lodgepole and Ponderosa pine
Location: Idaho, Nevada, Utah

Mortality due to pine engraver beetle remained static throughout the Region. Activity is often associated with western pine beetle. In Utah, populations were found in slash of ponderosa and lodgepole pine.

Spruce beetle

Dendroctonus rufipennis
Host: Spruce
Location: Idaho, Utah, Wyoming

Spruce beetle mortality decreased approximately 38 percent during 1995 with only 28,000 trees recorded compared to 45,200 in 1994. This decrease was attributed to a decline in host type on the Payette National Forest due to recent outbreaks and extensive wildfire in infested areas. No significant mortality was reported on any other Forests in southern Idaho. In Utah, where 27,000 trees were recorded, mortality increased on the Fishlake and Dixie National Forests and decreased on the Manti-LaSal National Forest. No significant mortality was observed on the Bridger-Teton National Forest in western Wyoming.

Subalpine fir Mortality Complex

Dryocetes confusus, Pityophthorus sp., Pityokeines sp., Crypturgus sp., Scolytus sp., Heterobasidion annosum, Armillaria sp., Cytospora abietis, Melampsporella caryophyllacearum
Host: Subalpine fir
Location: Idaho, Utah, Wyoming

During the previous seven years, subalpine fir mortality in Region 4 has been mostly attributed to the western balsam bark beetle (*Dryocetes confusus*). However, recent ground examinations of this year's widespread mortality suggest a complex of factors are involved in this mortality. These factors include: twig beetles, secondary bark beetles, wood borers, engraver beetles, root diseases, cankers, rusts, and environmental conditions.

This complex has resulted in the death of 418,800 trees throughout the Region. Currently, this mortality complex is the most widespread cause of visible mortality in the Region. In Idaho, 78,000 trees were killed during 1995 compared to 61,000 trees in 1994. Large areas of mortality are located on all forests in southern Idaho. In Utah, activity increased with 268,500 trees killed in 1995. Extensive mortality was observed on every forest in Utah. Activity increased in western Wyoming with 72,300 trees killed in 1995 compared to 54,500 trees in 1994.

Western pine beetle

Dendroctonus brevicomis
Host: Ponderosa pine
Location: Idaho

Western pine beetle activity increased on the Boise, Payette, and Sawtooth National Forests in southern Idaho. Approximately 16,000 trees were killed in 1995 compared to 6,300 in 1994. Pine engraver beetle activity was frequently associated with western pine beetle infestation.

Western spruce budworm

Choristoneura occidentalis
Host: Douglas-fir, True firs
Location: Idaho, Utah, Wyoming

No visible defoliation from spruce budworm was observed during aerial detection surveys in the Region during 1995. However, light defoliation was observed by ground crews in widely scattered locations in Bryce Canyon National Park and on the Dixie National Forest in Utah.

Fall cankerworm

Alsophila pometaria
Host: Gamble oak
Location: Utah

Defoliation on gamble oak (*Quercus gambellii*) occurred along the Wasatch Front in northern Utah from Spanish Fork to Brigham City. Pockets of moderate to heavy defoliation ranging from less than one to several hundred acres were observed in the spring of 1995.

Sequoia pitch moth

Synanthedon sequoiae
Host: Lodgepole and Ponderosa pine
Location: Nevada

Localized populations are found on the east side of the Sierras, on the Toiyabe National Forest. Populations are heavy, affecting ornamental Jeffrey pine in Carson City, NV.

Lodgepole pine terminal weevil

Pissodes terminalis
Host: Spruce and Lodgepole pine
Location: Utah

The weevil is abundant in some of the thinned stands of lodgepole pine on the Wasatch-Cache and Ashley National Forests in Utah. Populations are heaviest on the North Slope of the Uinta Mountains.

Roundheaded pine beetle

Dendroctonus adjunctus
Host: Ponderosa pine
Location: Utah

Ponderosa pine mortality is being caused by this beetle on the Pine Valley Ranger District, Dixie National Forest.

Status of Stem and Branch Diseases

Aspen trunk rot

Phellinus tremulae
Host: Aspen
Location: Idaho, Nevada, Utah, Wyoming

Decay occurs in most aspen stands in the Region and is increasingly common as aspen stands exceed 80 years of age.

White pine blister rust

Cronartium ribicola
Host: Whitebark pine, Limber pine
Location: Idaho

A formal survey of five-needled pines was initiated in 1995 to quantify disease incidence and intensity, and determine site and stand characteristics of infected areas.

Comandra blister rust

Cronartium comandrae
Host: Lodgepole pine, Ponderosa pine
Location: Idaho, Utah, Wyoming

Infection occurs infrequently throughout Idaho and Utah. Heavy, localized areas of infection resulting in branch, top, and entire tree mortality of sapling-size ponderosa pines occurs in southern Idaho. In Wyoming and northern Utah, infection frequently occurs on lodgepole pine in localized pockets.

Cytospora canker of true firs

Cytospora abietis
Host: True firs
Location: Idaho, Utah, Wyoming, Nevada

Branch flagging, top-killing, and mortality attributed to this fungus occurred in localized areas throughout host type. This disease was frequently associated with western balsam bark beetle attacks.

Dwarf mistletoes

Arceuthobium spp
Host: Douglas-fir, Lodgepole pine, Limber Pine, Bristlecone Pine, Ponderosa pine, Whitebark pine, Western larch, Jeffrey pine
Location: Idaho, Nevada, Utah, Wyoming

Suppression projects continue to remove infected overstory trees; however this forest disease remains the most widespread and frequently observed disease within the Intermountain Region. Regional incidence by major host species is as follows: lodgepole pine = 60 percent infected, ponderosa pine = 44 percent infected, and Douglas-fir = 43 percent infected. These numbers represent the percentage of host stands showing some level of infection.

True mistletoe on Juniper

Phoradendron juniperinum
Host: Junipers
Location: Nevada, Utah

Occurs on juniper on the Fishlake and Dixie National Forests in Utah and in Great Basin National Park in Nevada.

Limb rust

Peridermium filamentosum
Host: Ponderosa pine
Location: Utah

Infection causing branch mortality and occasional tree mortality occurs in all size classes of trees on the Dixie National Forest in southern Utah.

Red ring rot

Phellinus pini
Host: Western larch, True firs, Spruce, Douglas-fir, Pines
Location: Idaho, Utah, Wyoming

Infection intensity varies throughout stands in the Region.

Rust-red stringy rot

Echinodontium tinctorium
Host: Grand fir, White fir, Subalpine fir
Location: Idaho, Nevada, Utah

Decay caused by this fungus is common in mature and overmature stands of true firs.

Stalactiform blister rust

Cronartium coleosporiodes
Host: Lodgepole pine
Location: Idaho, Nevada, Utah

This rust occurs in localized areas throughout the host type. Heavy infection has been noted in localized areas on the Boise, Payette, Sawtooth, and Challis National Forests in Idaho.

Other stem decays

Cryptoporus volvatus, Fomitopsis officinalis, Laetiporus sulphureus
Host: Various conifers
Location: Idaho, Nevada, Utah, Wyoming

A large number of minor stem decay agents, too numerous to list, occur with varying intensity throughout the Region.

Western gall rust

Endocronartium harknessii
Host: Lodgepole pine, Ponderosa pine
Location: Idaho, Utah, Wyoming

Gall rust occurs throughout the host types. Infection levels vary, with localized heavy infection present in both host species.

Status of Root Diseases

Annosus root disease

Heterobasidion annosum
Host: Douglas-fir, Spruce, Lodgepole pine, Ponderosa pine, Jeffrey pine, True firs
Location: Idaho, Nevada, Utah, Wyoming, California

Infection causes varying amounts of root and butt rot in mature individuals of many tree species, and may result in predisposition to windthrow and/or beetle attack. Infection-induced mortality occurs occasionally in young ponderosa pine and seldom in other hosts.

Armillaria root disease

Armillaria spp.
Host: Douglas-fir, Grand fir, Pines, Spruce, Subalpine fir
Location: Idaho, Nevada, Utah, Wyoming

Evidence of Armillaria root disease can be found throughout the Region functioning primarily as a weak pathogen or saprophyte causing little direct mortality. In southern Utah, it may act as a primary pathogen, killing mature and immature ponderosa pine and mature fir and spruce.

White mottled rot

Ganoderma applanatum
Host: Aspen
Location: Idaho, Nevada, Utah, Wyoming

This pathogen is increasing in incidence throughout the Region. The disease can be found on windthrown aspen on the Dixie, Wasatch-Cache, and Fishlake National Forests in Utah; Humboldt National Forest in Nevada; and Caribou and Sawtooth National Forest in Idaho.

Black stain root disease

Ophiostoma wageneri
Host: Pinyon pine
Location: Idaho, Nevada, Utah

This fungus causes mortality of Pinyon pine on the Bureau of Land Management Burley District in Idaho, on the Humboldt and Toiyabe National Forests in Nevada, and on the Dixie and Manti-LaSal National Forests in Utah.

Schweinitzii butt rot

Phaeolus schweinitzii
Host: Douglas-fir, Ponderosa pine
Location: Idaho

Decay is common in mature and overmature forests throughout the host type, especially those with a frequent fire or logging history. The fungus is often associated with other root pathogens and bark beetle activity. Trees are seldom killed directly as a result of infection.

Tomentosus root disease

Inonotus tomentosus
Host: Douglas-fir, Spruce,Subalpine fir
Location: Idaho, Utah

This fungus is found alone or associated with *Phaeolus schweinitzii* and *Armillaria* spp. It causes root and butt rot of pole-sized and larger trees, predisposing them to bark beetle attack and windthrow. In southern Utah, it kills spruce in progressively enlarging disease centers.

Status of Foliage Diseases

Conifer - Aspen rust, Conifer - Cottonwood rust

Melampsora medusae, Melampsora occidentalis
Host: Aspen, Conifers, Cottonwood
Location: Idaho

Epidemic throughout the host range of all *Populus* species.

Douglas-fir needle cast

Rhabdocline spp.
Host: Douglas-fir
Location: Idaho, Wyoming

Incidence was light with infection noted throughout the range of Douglas-fir in southwestern Idaho. Heavy infection levels were observed on the Targhee and Bridger-Teton National Forests.

Elytroderma disease

Elytroderma deformans
Host: Ponderosa pine
Location: Idaho

Systemic and annual infections occur throughout the host type. Infection was especially severe on the Salmon National Forest where foliage discoloration was noted on over 3,500 acres.

Incense cedar broom rust

Gymnosporangium libocedri
Host: Incense cedar
Location: California, Nevada

This disease occurs in isolated patches of host trees on the Toiyabe National Forest.

Cedar apple rust

Gymnosporangium sp.
Host: Apple, Serviceberry
Location: Idaho

In eastern Idaho, this disease caused by an unknown species of *Gymnosporangium*, caused a leaf spot on residential apple trees in Challis and Salmon, and to *Amelanchier* throughout the range of serviceberry in eastern Idaho.

Fir broom rust

Melampsorella caryophyllacearum
Host: Subalpine fir
Location: Idaho, Nevada, Utah, Wyoming

Infections occur throughout the host's range. Infection intensity varies significantly, but is pandemic in stands south of the Snake River in Idaho.

Fir needle cast

Lirula spp.
Host: Subalpine fir, Grand fir
Location: Idaho

Infection is at endemic levels throughout the host type.

Fir needle rust

Pucciniastrum epilobii
Host: Subalpine fir
Location: Idaho, Wyoming

Scattered infection occurs on seedling and sapling size trees throughout the host type.

TABLE 2. *Status of mountain pine beetle-caused mortality by state during 1995.*

State	Land Ownership Class	Outbreak Area (Thousand Acres)	Number of Trees (Thousands)
Idaho	National Forest	7.3	9.3
	Other Federal	0.0	0.0
	State and Private	1.1	5.1
Idaho Total		**8.4**	**14.4**
Utah	National Forest	20.7	25.2
	Other Federal	0.0	0.0
	State and Private	0.2	0.3
Utah Total		**20.9**	**25.5**
Wyoming	National Forest	1.2	1.8
	Other Federal	0.0	0.0
	State and Private	0.0	0.0
Wyoming Total		**1.2**	**1.8**
Grand Total		**30.5**	**41.7**

TABLE 3. *Status of spruce beetle-caused mortality by state during 1995.*

State	Land Ownership Class	Outbreak Area (Thousand Acres)	Number of Trees (Thousands)
Idaho	National Forest	0.5	0.8
	Other Federal	0.0	0.0
	State and Private	0.1	0.1
Idaho Total		**0.6**	**0.9**
Utah	National Forest	14.0	26.9
	Other Federal	0.0	0.0
	State and Private	0.1	0.1
Utah Total		**14.1**	**27.0**
Wyoming	National Forest	0.1	0.1
	Other Federal	0.0	0.0
	State and Private	0.0	0.0
Wyoming Total		**0.1**	**0.1**
Grand Total		**14.8**	**28.0**

TABLE 4. *Status of Douglas-fir beetle-caused mortality by state during 1995.*

State	Land Ownership Class	Outbreak Area (Thousand Acres)	Number of Trees (Thousands)
Idaho	National Forest	26.2	32.5
	Other Federal	0.1	0.1
	State and Private	3.3	2.4
Idaho Total		**29.6**	**35.0**
Utah	National Forest	6.8	11.0
	Other Federal	0.0	0.0
	State and Private	0.6	0.5
Utah Total		**7.4**	**11.5**
Wyoming	National Forest	1.5	2.0
	Other Federal	0.0	0.0
	State and Private	0.0	0.0
Wyoming Total		**1.5**	**2.0**
Grand Total		**38.5**	**48.5**

TABLE 5. *Status of western pine beetle/Ips beetle-caused mortality by state during 1995.*

State	Land Ownership Class	Outbreak Area (Thousand Acres)	Number of Trees (Thousands)
Idaho	National Forest	6.3	7.1
	Other Federal	0.0	0.0
	State and Private	1.6	8.9
Grand Total		**7.9**	**16.0**

TABLE 6. *Status of Jeffrey pine beetle-caused mortality by state during 1995.*

State	Land Ownership Class	Outbreak Area (Thousand Acres)	Number of Trees (Thousands)
Nevada	National Forest	6.7	8.3
	Other Federal	0.0	0.0
	State and Private	0.3	0.5
Grand Total		**7.0**	**8.8**

TABLE 7. *Status of subalpine fir mortality complex by state during 1995.*

State	Land Ownership Class	Outbreak Area (Thousand Acres)	Number of Trees (Thousands)
Idaho	National Forest	54.8	61.3
	Other Federal	3.1	3.3
	State and Private	19.7	13.4
Idaho Total		**77.6**	**78.0**
Utah	National Forest	114.9	251.1
	Other Federal	0.0	0.0
	State and Private	9.7	17.4
Utah Total		**124.6**	**268.5**
Wyoming	National Forest	43.6	69.6
	Other Federal	0.0	0.0
	State and Private	1.6	2.7
Wyoming Total		**45.2**	**72.3**
Grand Total		**247.4**	**418.8**

TABLE 8. *Status of fir engraver beetle-caused mortality by state during 1995.*

State	Land Ownership Class	Outbreak Area (Thousand Acres)	Number of Trees (Thousands)
Idaho	National Forest	0.6	0.2
	Other Federal	0.0	0.0
	State and Private	0.1	0.2
Idaho Total		**0.7**	**0.4**
Utah	National Forest	54.2	72.0
	Other Federal	0.0	0.0
	State and Private	4.4	6.8
Utah Total		**58.6**	**78.8**
Nevada	National Forest	14.9	61.2
	Other Federal	0.0	0.0
	State and Private	0.2	0.3
Nevada Total		**15.1**	**61.5**
Grand Total		**74.4**	**140.7**

TABLE 9. *Number of acres aerially surveyed, by administrative area, during 1995.*

Administrative Area	Acres Surveyed (Thousands)
Ashley National Forest	756.6
Boise National Forest	2,120.1
Bridger-Teton National Forest	2,617.3
Bureau of Land Management	12.4
Caribou National Forest	948.5
Challis National Forest	1,032.0
Curlew National Grasslands	2.2
Dixie National Forest	1,477.1
Fishlake National Forest	642.3
Fort Hall Indian Reservation	33.6
Grand Teton National Park	0.1
State of Idaho	1,360.8
Payette National Forest	1,388.1
Salmon National Forest	997.5
Sawtooth National Forest	1,677.5
Targhee National Forest	1,210.4
Toiyabe National Forest	236.6
Uinta National Forest	871.1
State of Utah	547.5
Wasatch-Cache National Forest	1,883.2
State of Wyoming	29.5
Grand Total	**21,115.6**

FIGURE 1.

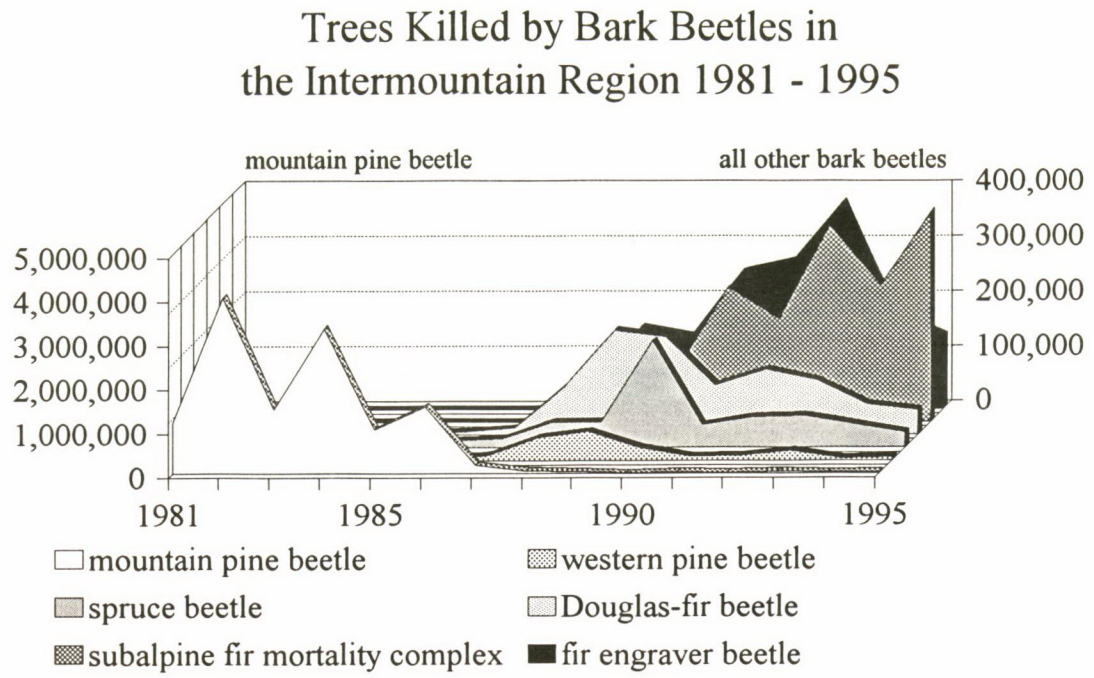


FIGURE 2.

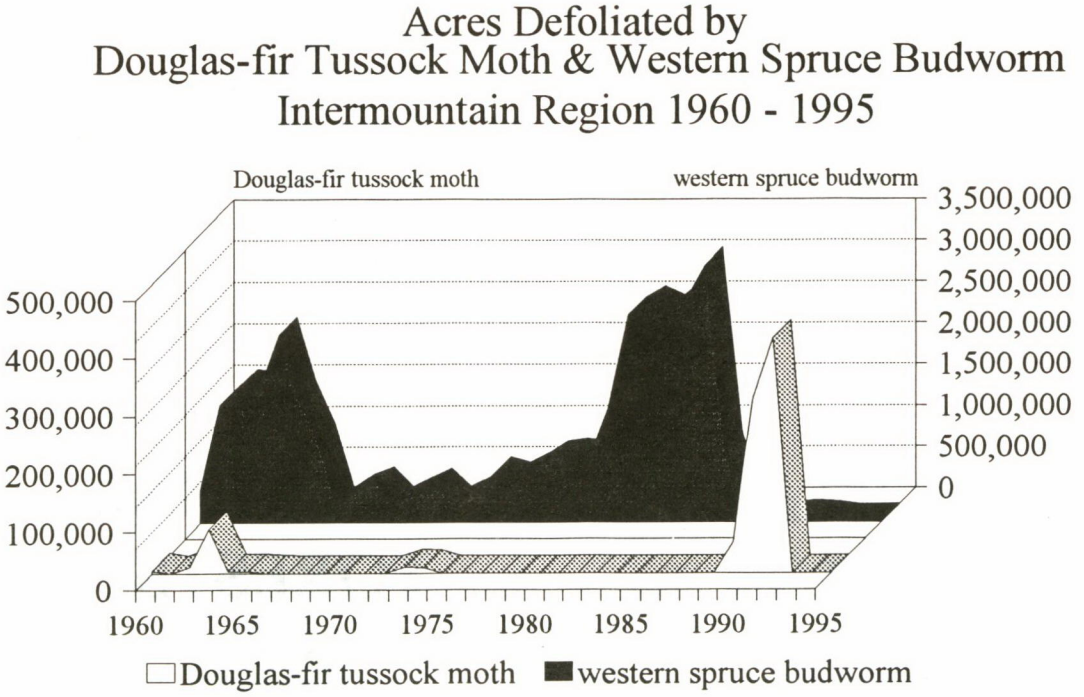
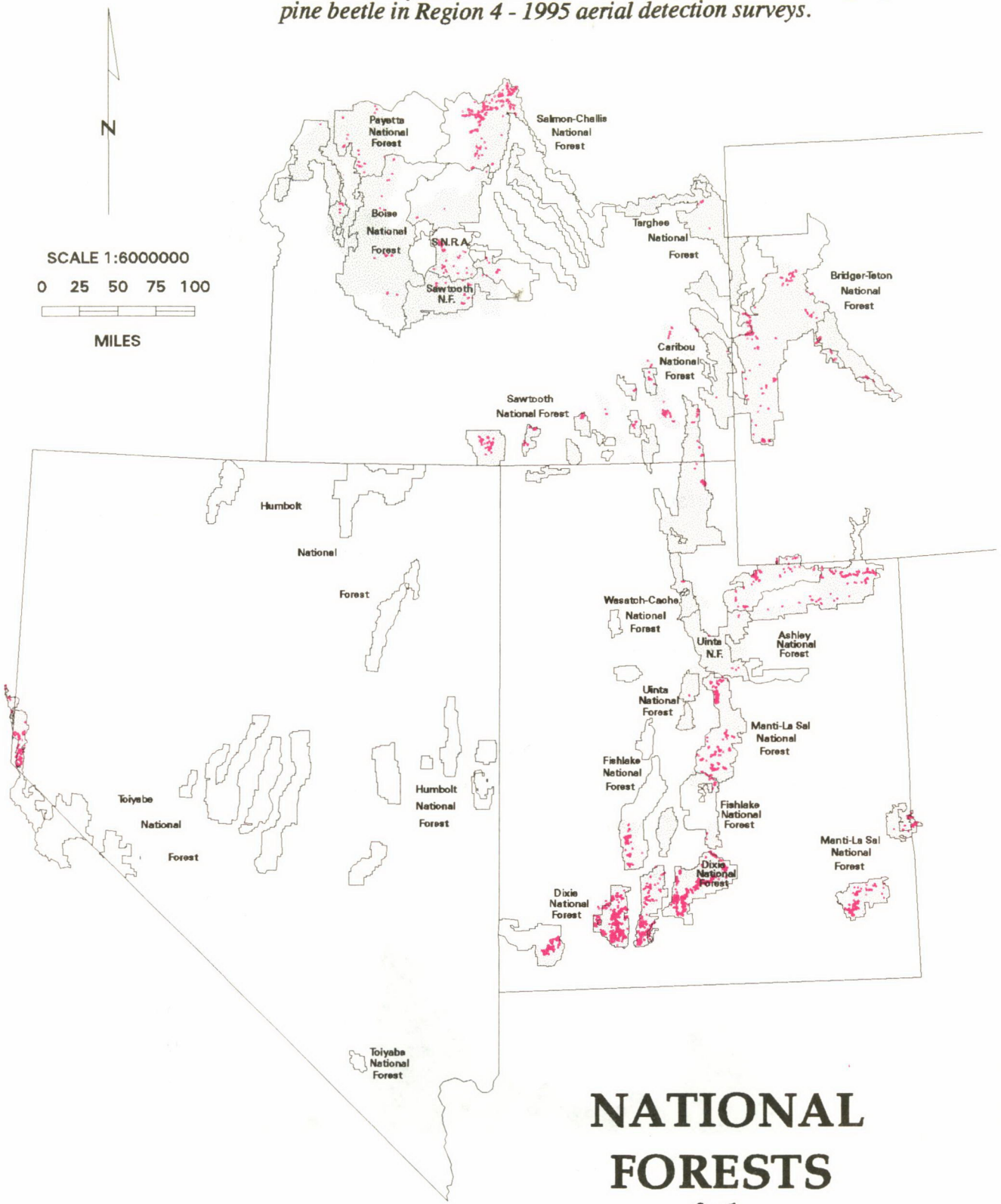


FIGURE 3. *Tree mortality associated with mountain pine beetle and Jeffrey pine beetle in Region 4 - 1995 aerial detection surveys.*



NATIONAL FORESTS of the INTERMOUNTAIN REGION

FIGURE 4. *Tree mortality associated with spruce beetle in Region 4 - 1995 aerial detection surveys.*

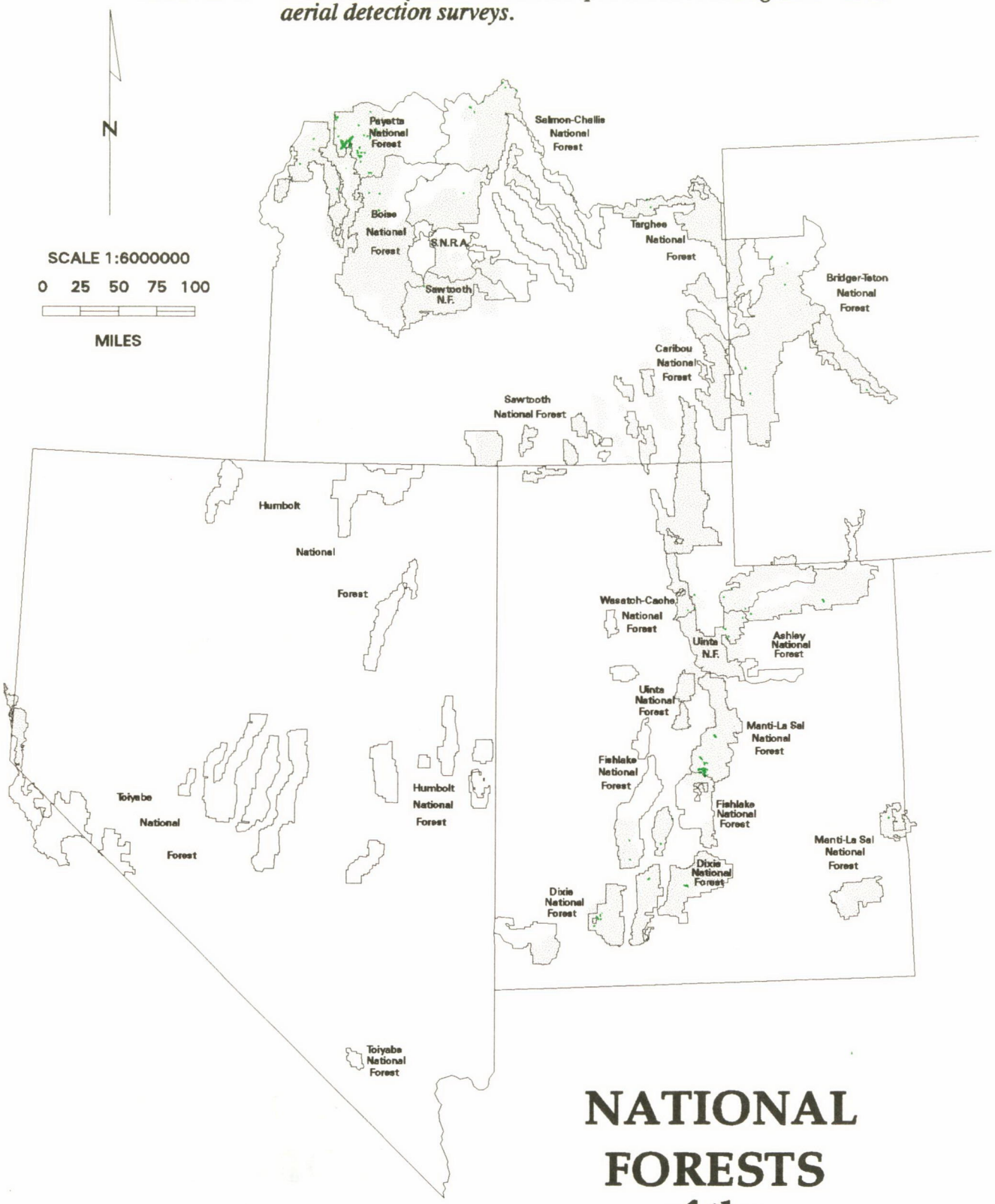


FIGURE 5. *Tree mortality associated with Douglas-fir beetle in Region 4 - 1995 aerial detection surveys.*

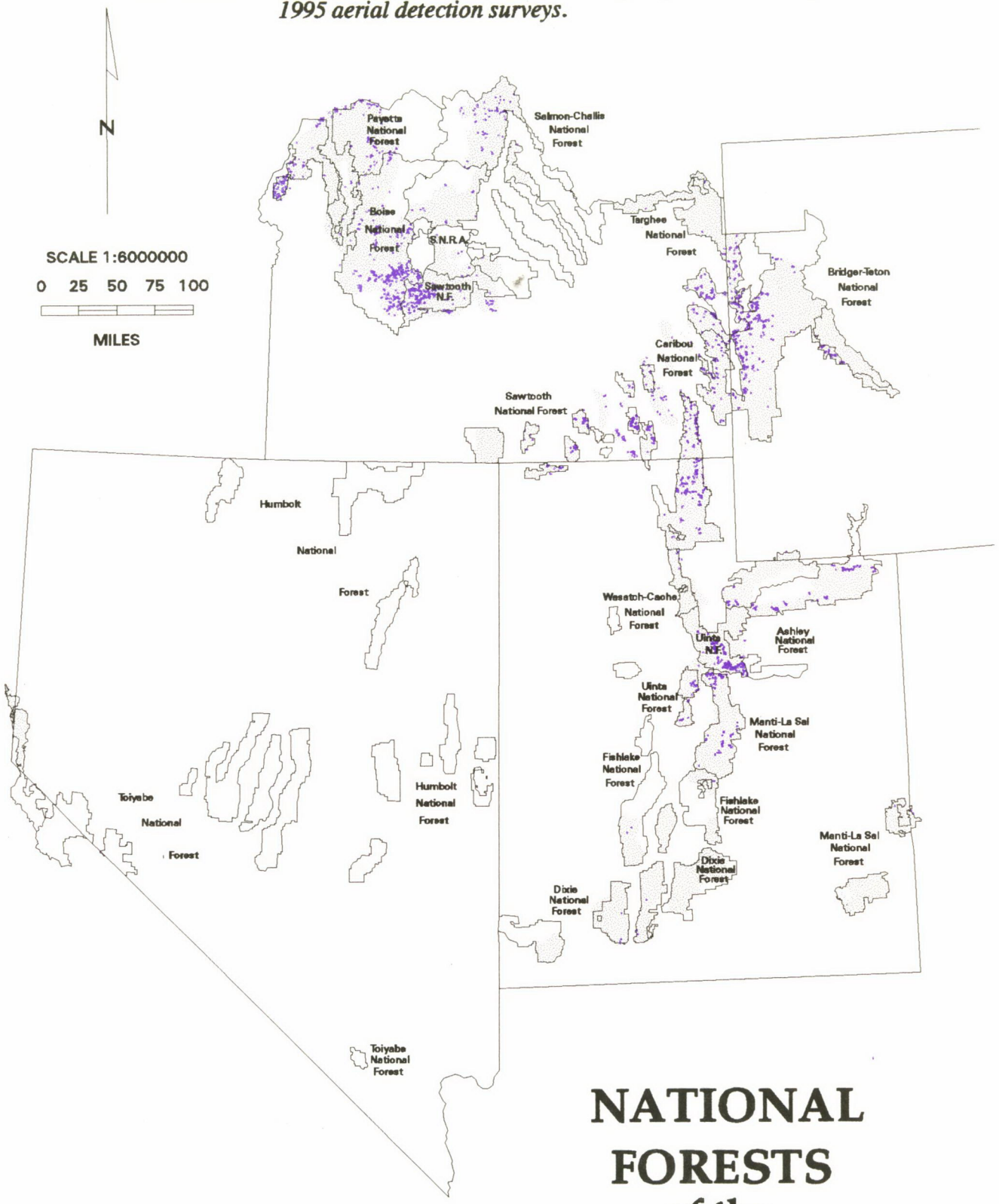


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FIGURE 6. *Tree mortality associated with western pine beetle and Ips beetle in Region 4 - 1995 aerial detection surveys.*

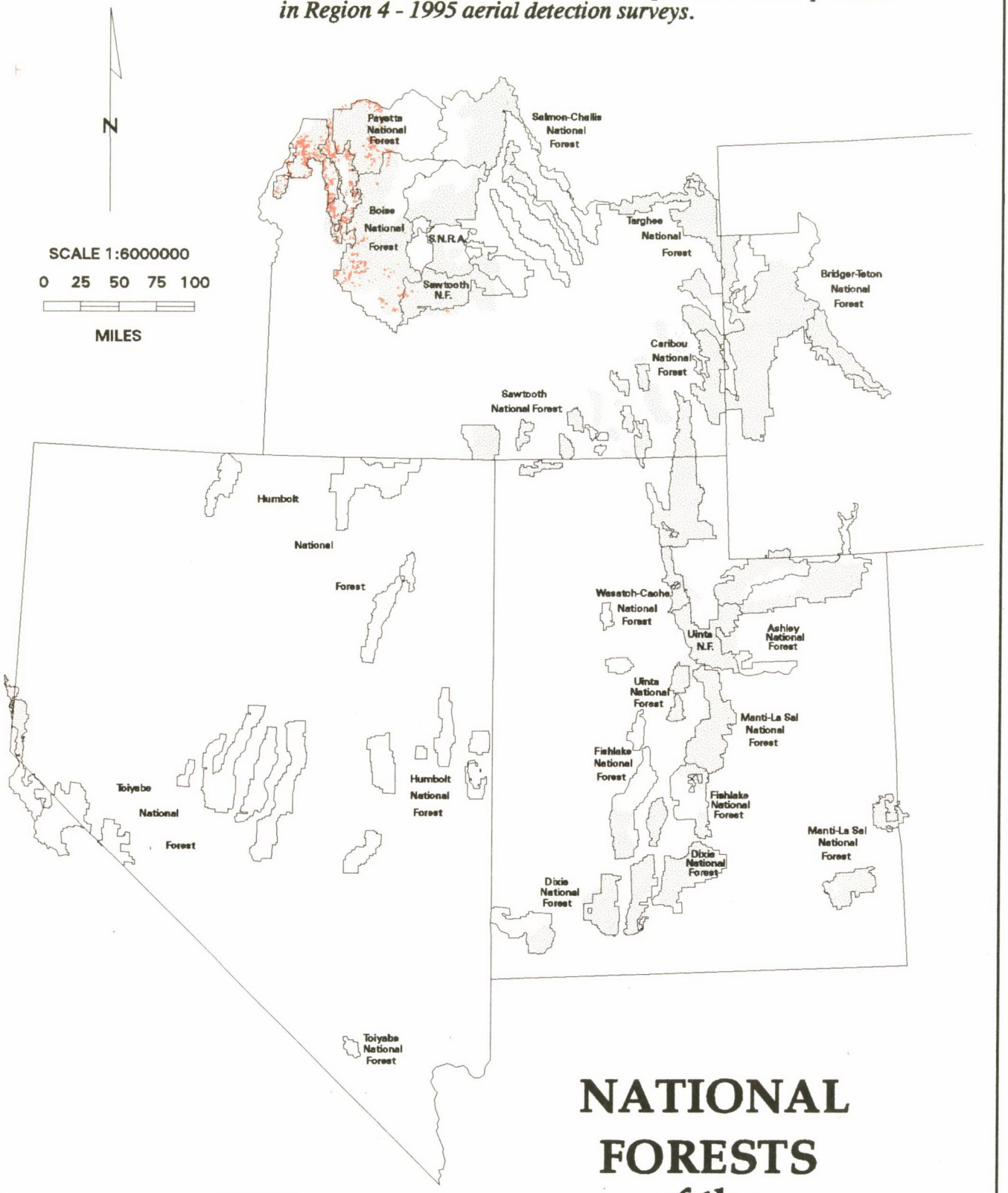
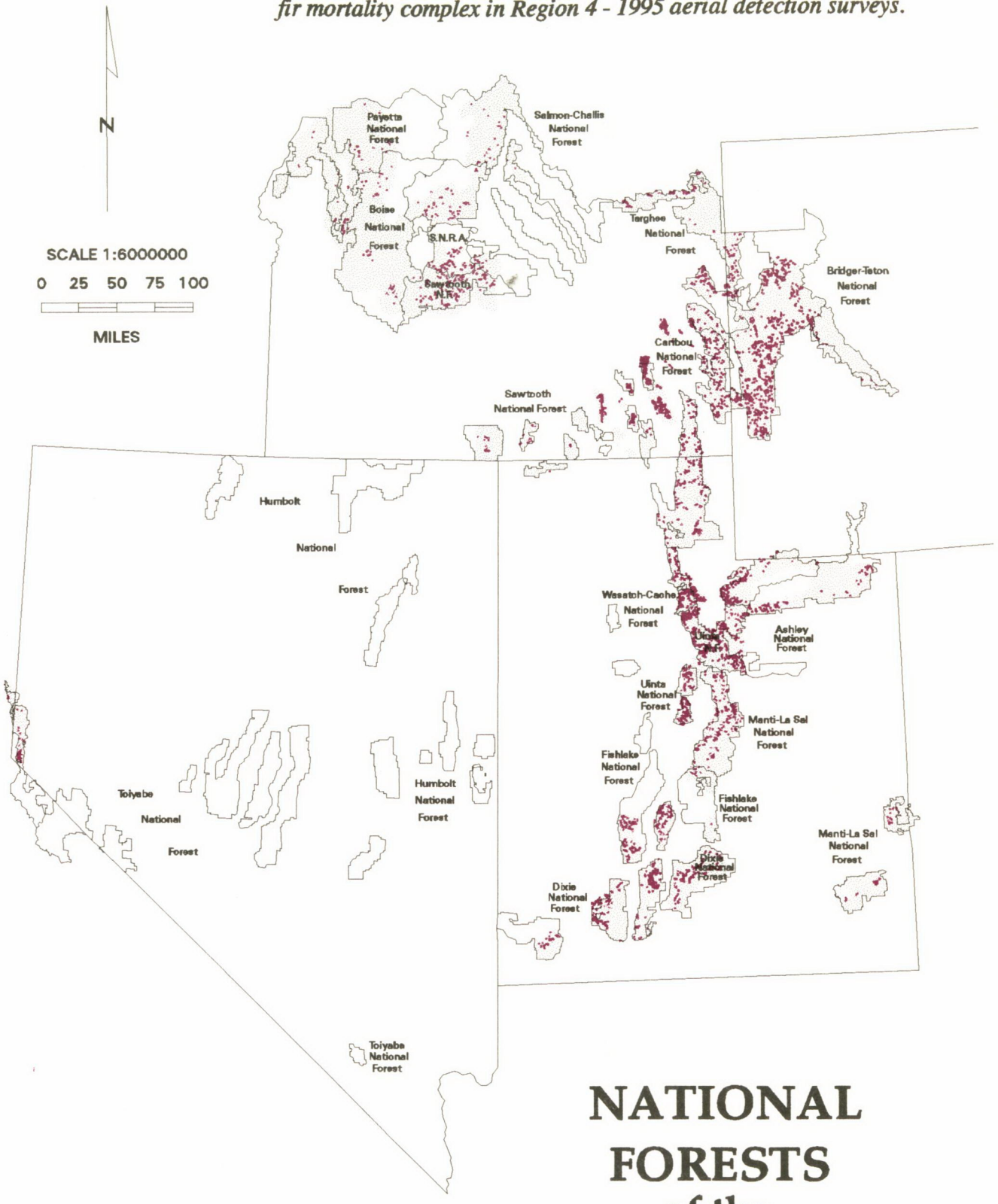


FIGURE 7. *Tree mortality associated with fir engraver beetle and subalpine fir mortality complex in Region 4 - 1995 aerial detection surveys.*



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SPECIAL PROJECT UPDATE

Optimal Dose of MCH Bubble Capsules for Protecting Douglas-fir from Attack by the Douglas-fir Beetle. Three replicates of this study were installed in Utah and southern Idaho to complement others in Montana and eastern Oregon. The project compared two lower doses of MCH bubble capsules (6/ac) and 12/ac) to a dose of 20/ac which was found to be effective in our 1994 investigation. Results have been submitted for publication. MCH treatments resulted in fewer infested trees compared to the untreated controls at doses as low as 20 capsules/ac. Contact: S. Munson or R. Thier.

Site and Stand Factors Associated with the Occurrence for Douglas-fir Beetle in Douglas-fir. Objectives are: 1) to determine site and stand characteristics associated with Douglas-fir beetle infestation, 2) develop a hazard rating with predictions of expected mortality, and 3) test available hazard rating schemes. The project was undertaken cooperatively with Regions 1, 2, and Rocky Mountain Forest and Range Experiment Station. Field investigations were completed in 1995 and data analysis has begun. Contact: S. Munson or R. Thier.

Alternatives to Methyl Bromide Fumigation, West-wide Nursery Research Effort. Final seedling measurements and analysis of plot data will be conducted in 1996. The project is intended to evaluate the efficacy of different cultural regimes to reduce the impacts of pests on conifer seedlings because of the impending loss of registration of the popular soil fumigant methyl bromide on January 1, 2001. Contact: J. Hoffman.

Douglas-fir Tussock Moth Impact Plots. A series of 5-plot transects were installed in Douglas-fir tussock moth defoliated areas in 1991. Thirty transects in moderately, heavily, and very heavily defoliated areas were monitored annually through 1995 to evaluate short term impacts associated with defoliation. Preliminary results indicate that 95 percent of the Douglas-fir trees which were totally defoliated in 1991 died during the 5-year monitoring period. Lesser levels of defoliation resulted in lower mortality rates; however, increasing levels of mortality attributed to Douglas-fir beetle were detected in these trees. Eighty percent of the grand fir trees which experienced more than 90 percent defoliation died during this same period. The final report will be available shortly. Contact: J. Weatherby.

Fire Survival Plots. In 1995, survival plots were installed in 6 areas burned during the 1994 wildfires on the Payette National Forest. These areas were selected because they represented underburn conditions in grand fir and subalpine fir habitat types. The objective of this study is to develop criteria which would accurately classify trees expected to die as a result of fire injury. These plots will be monitored through 1998. Contact: J. Weatherby.

Simulated Successional Pathway in the Absence of Harvest or Prescribed Burning for a Grand Fir Habitat Type. A prototype simulated successional pathway in the absence of harvest or prescribed burning for a grand fir habitat type is being developed by FPM and personnel from the Payette National Forest. This project takes stand exam data from a

representative stand of trees and projects the stand forward for 100 years using the Forest Vegetation Simulator. The effects of insects and fire are simulated. A draft has been prepared and is being evaluated by potential users. Contact: J. Weatherby.

Permanent Plots to Validate Forest Disease Models. This is an ongoing project to establish permanent plots to aide in the validation of disease models including the dwarf mistletoe model, the western root disease model, as well as models for comandra blister rust and limb rust. Progress in 1995 included the installation of five new plots, re-measurement of four plots installed in 1990, and re-measurement of six plots installed in 1992. The re-measurement data are currently being incorporated into the Pest Trend/Impact Plot System (PTIPS). Contact: J. Guyon.

Biological Controls for Noxious Weed Management. This project involves coordination and cooperation with George Markin from the Agricultural Research Service (ARS). It includes the distribution of biological control agents, selection of release sites, and installation of long-term monitoring plots to study the impacts on target, as well as non-target vegetative species. Contact: T. Barbouletos or J. Weatherby.

Rush Skeletonweed Research. This multi-year project involves coordination and cooperation with George Markin from the ARS. Plots will be installed in 1996 to gather baseline data on the effects of previously released biological control agents on skeletonweed and associated vegetation. Additional studies on new control agents are being conducted with the objective of having four to five new agents available within the next five years. Contact: T. Barbouletos or J. Weatherby.

Weed Free Forage Program. The State of Idaho implemented a forage certification program in 1994. Federal law, and Forest Service manuals direct that National Forest System lands in a state with forage certification program be closed to the use of non-certified products. Forest Pest Management took the lead in providing coordination with the three Regions that have management responsibilities in Idaho and other Federal and State agencies. We provided training and education in the use of weed free products to a variety of Federal agencies and public user groups. These efforts culminated in a special order closing all National Forest System lands in Idaho to non-certified products effective January 1, 1996. Contact: T. Barbouletos.

Implementing Data Visualization in Integrated Forest Planning - The Development of Spatially Defensible Visualizations of Forest Management Issues on the Dixie National Forest. The project will include: landscape scale forest visualizations, creating in-stand and oblique visualizations on demand from user determined locations within the database, enhancing the current abilities to change a visualization, dis-aggregating forest stand data to support the creation of visualization models, and transferring demonstration systems and immediate products to resource units with an interest in, and need for, forest visualization techniques. Contact: S. Munson.

RECENT PUBLICATIONS

Dymerski, A. and J. Anhold. 1995. *A Biological Evaluation of Bark Beetle Activity Within The Blue Springs/Reed Valley Analysis Area, Dixie NF, Cedar City RD.* FPM Report 95-01. Ogden, UT. USDA Forest Service, Intermountain Region, 20p.

Dymerski, A. and J. Anhold. 1995. *A Biological Evaluation of Bark Beetle and Mistletoe Activity Within the Pine Hollow Analysis Area, Dixie NF, Cedar City RD.* FPM Report 95-04. Ogden, UT. USDA Forest Service, Intermountain Region, 12p.

Hansen, D. 1995. *A Biological Evaluation of Douglas-fir Mortality, White River Drainage, Spanish Fork RD, Uinta NF.* FPM Report 95-03. Ogden, UT. USDA Forest Service, Intermountain Region, 15p.

Munson, S., V. Leonard, T. Mastro, J. McGovern, D. Levy, and D. Kucera. 1995. *Russian Far East Lymantriid Monitoring Project, Project Summary 1993-1994.* FPM Report 95-02. Ogden, UT. USDA Forest Service, Intermountain Region, 34p.

Thier, R. and S. Donnelly. 1994. *Evaluation of western pine beetle attractants applied to scorched ponderosa pines.* Trends in Agricultural Science and Entomology, 2:163-165.

Williams, R. and T. Barbouletos. 1995. *Assessment of Airborne Video at One Half and One Mile Swath Widths for Detecting and Quantifying Forest Insect and Disease Effects.* FPM Report 96-01. Ogden, UT. USDA Forest Service, Intermountain Region, 6p.

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